October 12, 2017

Mr. Jeffrey Crawford
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Rhode Island Department of Environmental Management
235 Promenade Street
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Mr. Frank Battagila USEPA Region 1
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Subject: Response to Comment Letter - Supplemental Pilot Study Work Plan for Ciba-Geigy RCRA Closure Project - In-Situ Subsurface Ozone Injections
Former Ciba-Geigy Facility, 180 Mill St., Cranston, Rhode Island
Corrective Action Area, Former Production Area
CEC Project 172-818

Dear Mr. Crawford:

Based on your email dated September 15, 2017 and on behalf of BASF Corporation (BASF), Civil & Environmental Consultants, Inc. (CEC) has revised the enclosed Supplemental Pilot Study Work Plan (Workplan) for Ciba-Geigy RCRA Closure Project to include the installation of an additional pair of nested monitoring wells. CEC has also tried to clarify the groundwater monitoring and sampling plan. The comments in your email are separated below for CEC to address your concerns specifically. Please see our responses below in italicized text following your comments.

Comment 1:
The Department has been reviewing the Supplemental Pilot Study Work Plan for Ciba Geigy RCRA Closure Project-Insitu Subsurface Ozone Injections by CEC for the former Ciba Geigy facility in Cranston, Rhode Island. A question has been raised concerning the proposed injection locations in the plan and the locations of the groundwater monitoring wells for post injection monitoring. It appears from the figures provided that there are not many monitoring wells, if any, located downgradient of the proposed injection wells. CEC makes the point within the work plan that site COCs may desorb from the soil and increase COC groundwater concentrations during treatment with ozone. The Department is concerned that the increased COC concentrations in groundwater could eventually impact the Pawtuxet River and that sufficient downgradient monitoring wells are not present to monitor for both the impacts to groundwater and the river.

Response:

We are proposing the addition of a nested pair of monitoring wells (PZ-7S and PZ-7D) (location indicated on Figures 1A and 1B of the enclosed Workplan) downgradient from the pilot-test area to

fill in a potential gap in monitoring well locations, totaling four pairs of new monitoring wells. With the addition of this nested pair, at least six downgradient monitoring wells are proposed to be monitored and sampled in the deepest zone (FSL zone). Four downgradient monitoring wells will be used to evaluate the effects of treatment in the middle zone (DLA zone). Three downgradient monitoring wells will be used to evaluate the overburden (UFL zone). In addition, several sidegradient monitoring wells are located within the anticipated zone of influence and are anticipated to provide additional data with regard to desorption. Please see Table 2 in the revised Workplan.

The desorption of COCs, which is documented to be a common occurrence during the early phases of ISCO, was mentioned to put forth our intention to monitor for increase in COC concentrations due to desorption as this would impact the number/depths of injection points and size of the ozone production and delivery unit for the final design/implementation.

Comment 2:
Additionally, it appears that there is only one round of post injection groundwater monitoring proposed.

Response:
In addition to the baseline sampling proposed in Table 1, two rounds of sampling are proposed with details indicated in a revised Table 2 – the first after 4 weeks of injections and a second round of sampling a week after the completion of 8 weeks of injections. Additionally, weekly groundwater monitoring is proposed for field parameters indicated on the revised Table 2.

Comment 3:
Please clarify and identify the locations of the monitoring wells to be sampled and whether or not additional downgradient monitoring wells are proposed for installation. Also, what is the plan for groundwater monitoring post pilot study?

Response:
A pair of nested wells (PZ-7S/D) are being added to the monitoring and sampling program at baseline, during and after pilot study as described above. One round of post-pilot study monitoring and sampling is proposed a week after 8 weeks of injections are completed.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Navpreet Brolowski, PE, LSP
Project Engineer

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Principal